Date Distributed: June 20, 2012

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

SUBGROUP ON PRESSURE VESSELS AND PIPING

AGENDA

Meeting of July 17, 2012
Columbus, Ohio

The National Board of Boiler & Pressure Vessel Inspectors
1055 Crupper Avenue
Columbus, Ohio 43229-1183
Phone: (614)888-8320
FAX: (614)847-1828

1. **Call to Order – 1:00 p.m.**

2. **Announcements**

3. **Adoption of the Agenda**

4. **Adoption of the Minutes of January 17, 2012**

5. **Review of the Roster (Attachment 1)**

6. **Action Items (Attachment 2)**

NB10-0201 ***Part 1 S3, SG Pressure Vessels and Piping-*** Expand the section on installation of thermal fluid heaters. This action item is a result of splitting NB09-0601into two parts. A task group of D. Patten, G. Halley, M. Wadkinson and P. Bourgeois has been assigned. (No Attachment)

January 2010
A progress report was given.

July 2010
A progress report was given by Mr. Gary Scribner.

January 2011
A progress report was given by Mr. Scribner

July 2011
A progress report was presented. Correction was made to the task group as listed to removing G. Scribner as Chair and listing D. Patten as Chair and M. Wadkinson.

January 2012
Don Patten reported no progress at this time.

July 2012
Mr. Patten is expected to report.

NB10-1201 ***Part 1 SC Installation-*** Request for a format change to NBIC Part 1 Code Rules. A task group of G. Scribner, S. Torkildson, S. Konopacki and D. Patten has been assigned. (Attachment 2, pp. 1-12)

July 2010
Mr. Scribner gave a progress report.

January 2011
Mr. Richards presented a progress report. The goal is to consolidate all the general requirements for Boilers, Pressure Vessels, etc.

July 2011
Mr. Richards reported with a handout created to compare power boilers and steam heating boilers. It was found that power boilers are lacking in the book so the task group is looking to expand wording on power boilers.

January 2012
Mr. Richards gave a progress report.

July 2012
Mr. Richards is expected to report.

NB11-2001 ***Part 1, 2.9.4 SG Pressure Vessels and Piping-*** Address the safe venting of isolatable economizers where the outlet is below the inlet of other communicable chambers (Headers, drums, etc.) (Attachment 2, pp. 12-20)

July 2011
Trent Miller of Victory Energy was present in the Pressure Vessels & Piping SG meeting to discuss issues with the wording of NBIC Part 1, Section 2.9.4. After discussions it was decided by the SG that Mr. Miller will resubmit his request in the correct format in accordance with NBIC Sec. 8 procedures. His request will then be reviewed which may result in further research with other manufacturers and ASME Section I & VIII.

January 2012
David Olsen of Victory Energy presented a proposed change in 2.9.4. A task group of D. Patten (Chair), S. Donopacki and D. Olsen (Representative of Victory Energy) was assigned. The task group met to rework the proposal to submit to the SC for approval.

Secretary note: A letter ballot was given for this action item and the item's Chair, Don Patten, decided this item needed revision and requested that the ballot be closed for more work.
July 2012
Mr. Patten is expected to report.

NB12-0302 ***Part 1, SG V&P*** Define installation requirements for (PVHO) hyperbaric chambers) This action item is a result of splitting NB09-0601into two parts. A task group of G. Scribner (Chair) and M. Richards has been assigned. (No Attachment)

January 2012
Mr. Scribner presented a progress report.

July 2012
Mr. Scribner is expected to report.

NB12-0304 ***Part 1, SG Pressure Vessels and Piping*** - Installation requirements for carbonated beverage systems. (No attachment)

January 2012
Gary Scribner presented a progress report and handout – Informational only. The task group continues to meet, has held a conference call and will be doing some testing (J. Ball) in the weeks to come.

July 2012
Mr. Scribner is expected to report.

7. **New Business**

8. **Future Meetings**

July 17-20, 2012, Columbus, Ohio
January 14-18, 2013, Mobile, Alabama

9. Adjournment

Respectfully Submitted,

Jeanne Bock
Secretary

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SG on Pressure Vessels and Piping

Member	Title	ExpirDate	Interest Category
Bock, Jeanne	Secretary		
Bourgeois, Paul		8/31/2013	Auth Inpection Agencies
Halley, Geoffrey		8/31/2013	Manufacturer
Konopacki, Stanley		8/31/2013	Users
Patten, Donald		2/28/2014	Manufacturer
Richards, H. Michael		8/31/2012	Users
Scribner, Gary	Chair	7/31/2014	Jurisdictional Authorities
Snyder, Raymond	Vice Chair	8/31/2012	Auth Inpection Agencies
Torkildson, Steve		8/17/2013	Manufacturer
Tyndall, Harold		1/31/2015	Auth Inpection Agencies

Total Members: 9

NB10-1201

Power Boilers

2.5.4 VENTILATION AND COMBUSTION AIR

a) The boiler room shall have an adequate air supply to permit clean, safe combustion, minimize soot formation,

and maintain a minimum of 19.5% oxygen in the air of the boiler room. The combustion and ventilation

air should be supplied by either an unobstructed air opening or by power ventilation or fans.1

b) Unobstructed air openings shall be sized on the basis of 1 sq. in. (650 sq. mm) free area per 2000 Btu/

hr (586 W) maximum fuel input of the combined burners located in the boiler room, or as specified in the

National Fire Protection Association (NFPA) standards for oil and gas burning installations for the particular

job conditions. The boiler room air supply openings shall be kept clear at all times.

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Steam Heating Boilers, Hot-Water Heating Boilers, Hot-Water Supply Boilers, and Potable Water Heaters

3.5.4 VENTILATION AND COMBUSTION AIR

a) The boiler room shall have an adequate air supply to permit clean, safe combustion, minimize soot formation,

and maintain a minimum of 19.5% oxygen in the air of the boiler room. The combustion and ventilation

air may be supplied by either an unobstructed air opening or by power ventilation or fans.4

b) Unobstructed air openings shall be sized on the basis of 1 sq. in. (645 sq mm) free area per 2000 Btu/

hr (586 W) maximum fuel input of the combined burners located in the boiler room, or as specified in the

National Fire Protection Association (NFPA) standards for oil and gas burning installations for the particular

job conditions. The boiler room air supply openings shall be kept clear at all times.

Attachment 2

NB10-1201

Power Boilers

- c) Power ventilators or fans shall be sized on the basis of 0.2 cfm (0.0057 cu meters per minute) for each
- 1000 Btu/hr (293 W) of maximum fuel input for the combined burners of all boilers located in the boiler
- room. Additional capacity may be required for any other fuel-burning equipment in the boiler room.
- d) When power ventilators or fans are used to supply combustion air, they shall be installed with interlock
- devices so that the burners will not operate without an adequate number of ventilators/fans in operation.
- e) The size of openings specified in NBIC Part 1, 2.5.4 b) may be reduced when special engineered air supply
- systems approved by the Jurisdiction are used.
- f) Care should be taken to ensure that steam and water lines are not routed across combustion air openings,
- where freezing may occur in cold climates.

Steam Heating Boilers, Hot-Water Heating Boilers, Hot-Water Supply Boilers, and Potable Water Heaters

c) Power ventilators or fans shall be sized on the basis of 0.2 cfm (.0057 cu meters per minute) for each
1,000 Btu/hr (293 W) of maximum fuel input for the combined burners of all boilers and/or water heaters
located in the boiler room. Additional capacity may be required for any other fuel burning equipment in the
boiler room.
d) When power ventilators or fans are used to supply combustion air, they shall be installed with interlock
devices so that the burners will not operate without an adequate number of ventilators/fans in operation.
e) When combustion air is supplied to the heating boiler by an independent duct, with or without the employment
of power ventilators or fans, the duct shall be sized and installed in accordance with the manufacturer's
recommendations. However, ventilation for the boiler room must still be considered.
f) The size of openings specified in NBIC Part 1, 3.5.4 b) may be reduced when special engineered air supply
systems approved by the Jurisdiction are used.
g) Care should be taken to ensure that steam and water lines are not routed across combustion air openings,
where freezing may occur in cold climates.

Power Boilers

2.5.5 LIGHTING

The boiler room should be well lighted and it should have an emergency light source for use in case of power failure.

Steam Heating Boilers, Hot-Water Heating Boilers, Hot-Water Supply Boilers, and Potable Water Heaters

3.5.5 LIGHTING

The boiler room should be well lighted, and it should have an emergency light source for use in case of power failure.

3/13

Power Boilers

2.5.6 EMERGENCY VALVES AND CONTROLS

All emergency shut-off valves and controls shall be accessible from a floor, platform, walkway, or runway. Accessibility

shall mean within a 6 ft. (1.8 m) elevation of the standing space and not more than 12 in. (305 mm)

horizontally from the standing space edge.

Steam Heating Boilers, Hot-Water Heating Boilers, Hot-Water Supply Boilers, and Potable Water Heaters

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horizontally from the standing space edge.

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Power Boilers

2.6 DISCHARGE REQUIREMENTS

2.6.1 CHIMNEY OR STACK

Chimneys or stacks shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards, as applicable.

2.6.2 ASH REMOVAL

Ash removal systems shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards, as applicable.

Steam Heating Boilers, Hot-Water Heating Boilers, Hot-Water Supply Boilers, and Potable Water Heaters

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Ash removal systems shall be installed in accordance with jurisdictional and environmental requirements, manufacturer's recommendations, and/or industry standards, as applicable.

3.6.3

Power Boilers

2.4.3 DRAINS

At least one floor drain shall be installed in the boiler room.

Steam Heating Boilers, Hot-Water Heating Boilers, Hot-Water Supply Boilers, and Potable Water Heaters

3.6.3 DRAINS

Unobstructed floor drains, properly located in the boiler room, will facilitate proper cleaning of the boiler room.

Floor drains that are used infrequently should have water poured into them periodically to prevent the entrance

of sewer gasses and odors. If there is a possibility of freezing, an environmentally safe antifreeze mixture

should be used in the drain traps. Drains receiving blowdown water should be connected to the sanitary sewer

by way of an acceptable blowdown tank or separator or an air gap that will allow the blowdown water to cool

to at least 140°F (60°C) and reduce the pressure to 5 psig (34 kPa) or less.

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Power Boilers

Steam Heating Boilers, Hot-Water Heating Boilers, Hot-Water Supply Boilers, and Potable Water Heaters

3.7 OPERATING SYSTEMS

3.7.1 OIL HEATERS

a) A heater for oil or other liquid harmful to boiler operation shall not be installed directly in the steam or water

space within a boiler.

b) Where an external-type heater for such service is used, means shall be provided to prevent the introduction

into the boiler of oil or other liquid harmful to boiler operation.

Power Boilers

- 2.10 TESTING AND ACCEPTANCE
- 2.10.1 GENERAL
- a) Care shall be exercised during installation to prevent loose weld material, welding rods, small tools, and
- miscellaneous scrap metal from getting into the boiler. Where possible, an inspection of the interior of the
- boiler and its appurtenances shall be made for the presence of foreign debris prior to making the final
- closure.
- b) Safe operation should be verified by a person familiar with boiler system operations for all boilers and connected
- appurtenances and all pressure piping connecting them to the appurtenances and all piping up to
- and including the first stop valve, or the second stop valve when two are required.
- c) The wall thickness of all pipe connections shall comply with the requirements of the code of construction
- for the boiler.
- d) All threaded pipe connections shall engage at least five full of the pipe or fitting.
- e) In bolted connections, the bolts, studs, and nuts shall be marked as required by the original Code of Construction
- and be fully engaged (e.g., the end of the bolt or stud shall protrude through the nut).
- f) Washers shall only be used when specified by the manufacturer of the part being installed.

Steam Heating Boilers, Hot-Water Heating Boilers, Hot-Water Supply Boilers, and Potable Water Heaters

3.10 TESTING AND ACCEPTANCE

Power Boilers

2.10.2 PRESSURE TEST

Prior to initial operation, the completed boiler, including pressure piping, water columns, superheaters,

economizers, stop valves, etc., shall be pressure tested in accordance with the original code of construction.

Any pressure piping and fittings such as water columns, blowoff valves, feedwater regulators, superheaters,

economizers, stop valves, etc., which are shipped connected to the boiler as a unit, shall be hydrostatically

tested with the boiler and witnessed by an Inspector.

Steam Heating Boilers, Hot-Water Heating Boilers, Hot-Water Supply Boilers, and Potable Water Heaters

3.10.1 PRESSURE TEST

Prior to initial operation, the completed boiler, individual module, or assembled module, shall be subjected to

a pressure test in accordance with the requirements of the original code of construction.

Power Boilers

Steam Heating Boilers, Hot-Water Heating Boilers, Hot-Water Supply Boilers, and Potable Water Heaters

2.10.3 NONDESTRUCTIVE EXAMINATION

Boiler components and subcomponents shall be nondestructively examined as required by the governing

Code of Construction.

2.10.4 SYSTEM TESTING

Prior to final acceptance, an operational test shall be performed on the complete installation. The test data

shall be recorded and the data made available to the jurisdictional authorities as evidence that the installation

complies with the provisions of the governing code(s) of construction. This operational test may be used as

the final acceptance of the unit.

4/1/01

Power Boilers

2.10.5 FINAL ACCEPTANCE

A boiler may not be placed into service until its installation has been inspected and accepted by the appropriate jurisdictional authorities.

Steam Heating Boilers, Hot-Water Heating Boilers, Hot-Water Supply Boilers, and Potable Water Heaters

3.10.2 FINAL ACCEPTANCE

a) In addition to determining that all equipment called for is furnished and installed in accordance with the plans and specifications, all controls shall be tested by a person familiar with the control system.

b) Before any new heating plant (or boiler) is accepted for operation, a final (or acceptance) inspection by a person familiar with the system shall be completed and all items of exception corrected.

Power Boilers

2.10.6 BOILER INSTALLATION REPORT

a) Upon completion, inspection, and acceptance of the installation, the installer shall complete and certify

the *Boiler Installation Report I-1. See NBIC Part 1, 1.4.5.1.*

b) The *Boiler Installation Report I-1 shall be submitted as follows:*

1) One copy to the Owner; and

2) One copy to the Jurisdiction, if required.

Steam Heating Boilers, Hot-Water Heating Boilers, Hot-Water Supply Boilers, and Potable Water Heaters

3.10.3 BOILER INSTALLATION REPORT

a) Upon completion, inspection, and acceptance of the installation, the installer shall complete and certify

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b) The *Boiler Installation Report I-1 shall be submitted as follows:*

1) One copy to the Owner; and

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COMMITTEE CORRESPONDENCE

COMMITTEE: NBIC

TO: NBIC Committee

ADDRESS WRITER CARE OF:
The National Board of Boiler &
Pressure Vessel Inspectors
1055 Crupper Avenue
Columbus, Ohio 43229-1183
Phone: (614) 888-8320
Fax: (614) 847-1828

FROM: Robin Hough
NBIC Secretary

SUBJECT: Letter Ballot NB11-2001 MC

DATE: March 30, 2012

Committee Members,

Letter ballot NB11-2001 MC has now closed. The ballot was approved. The voting results are:

20	Approved
1	Disapproved
1	Abstained
1	Not Voting
3	Not Returned

Per the NBIC Procedures 7.3.2:

"NBIC Committee or subcommittee members shall be apprised of any unresolved comments and given two (2) weeks from notification to reconsider their original vote."

The ballot will remain open until April 13, 2012 for your reconsideration.

:rmh

Ballot Comments

Name	Document	Comment	Date Created
Donald Patten	NB11-2001	I looked at ASME 2007 edition Addenda 2009 and found nothing stipulating the location of a relief valve for isolable economizers. Please see a copy of the attached from said edition. If anyone can point me in the direction of where I can find this information I would greatly appreciate it.	03/27/2012
Donald Patten	NB11-2001	I responded with a copy of the attached from ASME. I could not find any stipulation for isolable economizers relief valve location. I had asked Mr. Pillows to please provide this information so I could review.	03/27/2012
Donald Patten	NB11-2001	I look at ASME Section 1 2007 Addenda 2009. I could not find any stipulation of relief valve location. See attached copy of PG 67.2.6. If you could point me to the section that designates or stipulates installation location of a relief valve for an isolable economizer I would greatly appreciate it.	03/27/2012
Paul Edwards		I would like to see a response to Mr. Pillow's concern.	03/26/2012
James Pillow		Jpillow 3/21/12 I disapprove because the proposal is an attempt to re-write ASME Section I rules that already address mounting of pressure relief valves. Section I does not allow the mounting of the valves "as recommended by the Manufacturer". Keep in mind that Part 1 of the NBIC does not overrule the Section I rules.	03/21/2012
Donald Patten		Mr. Richardson, I queried Mr. Olson at Victory Energy and below is his comments: Locating the PSV at the outlet without specifying an outlet location does not support an idea that the outlet of an isolated economizer is the strategic location for the PSV. The commenter is correct that, when the economizer is isolated, rarified fluid will immediately begin to collect at the upper areas. Due to the fact that the PSV can be set very close to operating pressures, the time element may not always come into affect. Anyway we look at it, allowing or the PSV location to be determined by the Designer is most beneficial. Regards, David Olson	03/21/2012
John Richardson		I approve this ballot with some hesitation. During normal operation the cooler, more dense fluid if. water or wet steam would be entering the top of the exchanger. The valve is apparently sized for steam but is the slower discharge rate advisable ?? When isolation occurs a sudden transient would follow in which the more rarified fluid would collect at the top. Is it possible that the original requirement to place the PRV at or near the outlet was due to the time element?? How rapid is the pressure rise in the heat	03/07/2012

	exchanger?? How long does the heat input continue?? I trust Victory Energy has looked at all the credible scenarios. Perhaps I will have a chance to look at this a bit closer before the ballot closes.	
George Galanes, PE	This is more of an editorial comment, but I believe it would be better stated below; The safety valve shall be installed in a location either recommended by the manufacturer, or if no recommendation is provided shall be located as close as practical to the economizer outlet.	03/02/2012

NB 11-2001 ***Part 1, 2.9.4 SG Pressure Vessels and Piping*** - Address the safe venting isolatable economizers where the outlet is below the inlet of other communicable chambers (Headers, drums, etc.)

Current Language:

2.9.4 ECONOMIZERS

An economizer that may not be isolated from a boiler does not require a safety relief valve. Economizers that may be isolated from a boiler or other heat transfer device, allowing the economizer to become a fired pressure vessel, shall have a minimum of one safety relief valve. Discharge capacity, rated in lbs/hr (kg/hr), of the safety relief valve or valves shall be calculated from the maximum expected heat absorption rate in Btu/hr (Joules/hr) of the economizer, and will be determined from manufacturer data, divided by 1000. The safety relief valve shall be located as close as possible to the economizer outlet.

Proposed Language:

2.9.4 ECONOMIZERS

An economizer that may not be isolated from a boiler does not require a safety relief valve. Economizers that may be isolated from a boiler or other heat transfer device, allowing the economizer to become a fired pressure vessel, shall have a minimum of one safety relief valve. Discharge capacity, rated in lbs/hr (kg/hr), of the safety relief valve or valves shall be calculated from the maximum expected heat absorption rate in Btu/hr (Joules/hr) of the economizer, and will be determined from manufacturer data, divided by 1000. The safety relief valve shall be installed in a locationed recommended by the manufacturer, when no recommendation exists the location shall be as close as practical possibleto the economizer outlet.

Statement of Need

Victory Energy intends to design isolatable economizers, in accordance with ASME Section I and VIII Div1, and have the PSV located on the uppermost chamber instead of the Outlet connection. ASME requirements for PSVs ensure that the PSV is large enough to vent the energy in the form of steam. The same size PSV venting hot water potentially releases many more times the energy as venting steam. The amount of energy released in a given time is often excessive for vent piping, condensate tanks, and drains to handle. It is preferred to vent the energy as steam, over a longer period of time. Rapid draining of the economizer also allows the economizer to rapidly increase in temperature, causing undue stress. Furthermore, this request should serve to more closely align this part of the code with the ASME codes.

Background Information

An example would be a vertical counterflow economizer where the inlet header is located above the outlet (as in Figure 1) If the designer can specify where the PSV be located then the PSV may be placed such that the release of energy, via steam, happens more slowly through the same size PSV.

Figure 1 illustrates a counter-flow economizer, in a vertical up gas path, having horizontal headers, with the outlet header below the inlet. When this type of economizer is isolated during operation, and the PSV is tripped, steam will begin to collect in the upper "inlet" header. This design allows a more controlled venting of isolatable economizers by venting steam instead of hot water. Figure 1 also illustrates moving the safety relief valve from the outlet to the preferred location.

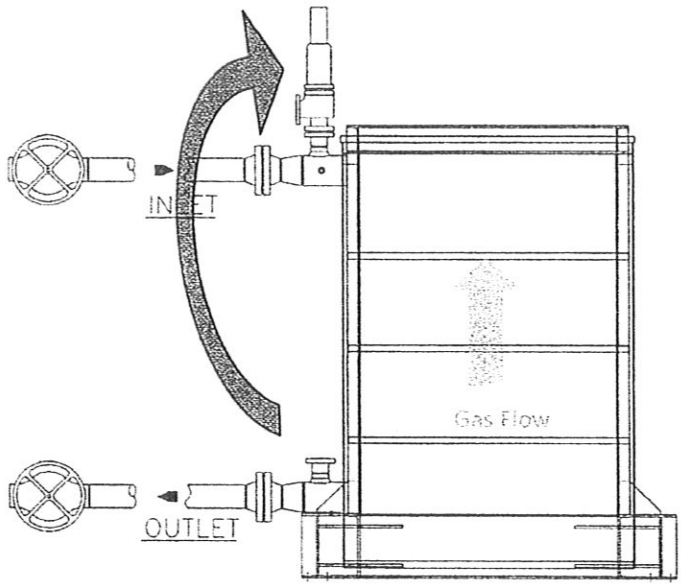

Figure 1

David Olson

QCM

Victory Energy Operations, LLC

918-340-9942